

HORAK, Janusz, mgr inż.

Duration of maximum losses depending on the peak load duration.  
Energetyka Pol 18 no. 4 [i.e. 5]:152-155 y '64.

1. Institute of Power Engineering, Department of Electric  
Networks, Warsaw.

*HORAK Jaromir*

CZECHOSLOVAKIA/Electricity - Semiconductors

G-3

Abs Jour : Ref Zhur - Fizika, No 2, 1958, No 3794

Author : Horak Jaromir, Machovec Mojmir, Kosek Frantisek

Inst : Not Given

Title : Zinc Telluride as a Semiconductor

Orig Pub : Ceskosl. casop. fys., 1957, 7, No 4, 361-368

Abstract : An investigation was made of the properties of ZnTe as a semiconductor. The ZnTe was synthesized in pure nitrogen at a temperature of 800°C. The conductivity of zinc telluride was measured in a temperature range from 0 to 1400°C using a thin copper-zinc telluride-copper layer. Plots are constructed for the dependence of  $\log \sigma$  on  $1/T$  and the activation energy  $\Delta W = 3.94 \times 10^{-4} (\log \sigma_1 - \log \sigma_2) (1/T_2 - 1/T_1)$  electron volts is calculated and is found to be on the average 0.25 ev. No photoeffect was observed in zinc telluride. The thermal emf was measured with a method described by Frank (Referat Zhur Fizika, 1956, No 10, 29062) with a Cu-ZnTe contact. It turned out that the value of the thermal emf was 0.5 mv/deg. The conductivity is of P type. Bibliography, 18 titles.

Card : 1/1

CZECHOSLOVAKIA/Electricity - Semiconductors

"APPROVED FOR RELEASE: 09/21/2001 CIA-RDP86-00513R000618120012-0"

Abs Jour : Ref Zhur - Fizika, No 5, 1958, No 11010

Author : Horak Jaromir, Machovec Mojmir, Kosek Frantisek

Inst : Chemical and Technological Institute, Pardubice, Czechoslovakia

Title : Zinc Telluride, A Semiconducting Compound

Orig Pub : Chekhosl. fiz. zh., 1957, 7, No 4, 468-475

Abstract : An investigation was made of the semiconducting properties of single crystals of zinc telluride, obtained by evaporation of ZnTe powder in vacuum. The procedure of making the single crystals is described and data are given on the temperature dependence of the conductivity. By measuring the thermal emf it was established that the conductivity of ZnTe is of the p-type. No photoconductivity was observed on the investigated specimens.

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**APPROVED FOR RELEASE: 09/21/2001**

**CIA-RDP86-00513R000618120012-0"**

HORAK, J.

Measuring the radioactivity of precipitations.

P. 18. (KRIDLA VLASTI.) (Praha, Czechoslovakia) No. 1, Jan. 1958

SO: Monthly Index of East European Accession (EFAI) LC. Vol. 7, No. 5, 1958

CZ/8-52(82)-10-5/39

**AUTHORS:** Horák, J, Klikorka, J and Čelíkovský, A.

**TITLE:** Zinc Selenides. II (O selenidu zinečnatém. II). Nature of Luminescence of Zinc Selenide (Charakter luminiscence selenidu zinečnatého)

**PERIODICAL:** Chemické Listy, 1958, Vol. 52(82), Nr 10, pp 1872 - 1876 (Czechoslovakia)

**ABSTRACT:** The appearance and disappearance of red luminescence of zinc selenide, due to reduction and oxidation media and an atmosphere of inert gas (nitrogen) and vacuum were observed. The possible disturbances of the crystalline grating of cubical zinc selenide were analysed, and the disturbances which could form luminescent centres investigated. 10 samples of zinc selenide were prepared at temperatures varying from 120 - 850°C, and the luminescence under the influence of cathode rays determined. This luminescence ranges from the yellow to the infra-red region. The authors calculated that the vacancies in selenium are the most likely luminescent centres in the cubical crystalline grating of zinc selenide. Active impurities which could cause the luminescence of zinc selenide were also investigated. A very pure sample was obtained by repeated sublimation in vacuum; only Cu could be determined by spectral

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CZ/8-52(82)-10-5/39

Zinc Selenides.II. Nature of Luminescence of Zinc Selenide

analysis. This sample showed intensive red luminescence under the action of electrons. Riehl and Ortmann (Refs. 11 and 13) proved that some metallic ions function as stabilisers of disturbances. During investigations of the luminescence of ZnO and ZnS it was shown that the luminescent centres are vacancies of oxygen or sulphur, and that metallic impurities stabilise to a larger or lesser degree the aforementioned disturbances in the crystalline grating. By applying this idea to the luminescence of ZnSe it can be stated that the luminescence of zinc selenide is due to the vacancies in selenium, and that these are stabilised by various metallic impurities. Zinc selenide was also found to

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CZ/8-52(82)10-5/39

Zinc Selenides.II. Nature of Luminescence of Zinc Selenide

be semi-conductor of type N which indicates a surplus of cations in the zinc selenide grating. There are 13 References:3 English, 7 German, 1 Czech, 1 Japanese and 1 Russian

ASSOCIATION:Katedra anorganické chemie, Vysoká škola chemicko-technologická, Pardubice (Department of Inorganic Chemistry Institute for Chemical Technology, Pardubice)

SUBMITTED: 16th November, 1957

Card 3/3

CZ/8/52(82)/10-27/39

AUTHORS: Horák, J., Klikorka, J. and Čelikovsky, A.

TITLE: On Zinc.-Selenide. III. Rectifying effect of Zn/ZnSe/Al cell (O selenidu zinečnatém. III. Usměrnovací efekt článku Zn/ZnSe/Al)

PERIODICAL: Chemické Listy, 1958, Vol 52(82), Nr 10, pp 1996-1998 (Czechoslovakia)

ABSTRACT: The Zn/ZnSe/Al cell was examined for rectifying effect. This cell did not show good rectifying properties. Diagram of cell is given together with its method of preparation and certain results. There are 3 figures, 1 table and 4 references, 3 of which are Czech, 1 English.

ASSOCIATION: Vysoká škola chemicko-technologická, Pardubice (Technical University of Chemical Technology, Pardubice)

Card 1/1

3



Thermal dissociation of zinc oxide. Jiri Kilikorka, Jan-  
mír Horák, and Alex Čelíkowský (Vysoká škola chem.  
technol., Pardubice, Czech.). Chem. listy 52, 2220-9  
(1958).—ZnO prepd. by the dehydration of pure Zn(OH)<sub>2</sub>  
was tempered at temps. from 400 to 1400° in air at normal  
pressure and at a pressure of  $10^{-3}$  mm. From its lumines-  
cence one concludes that in the temp. range 800-1400° pre-  
dominantly elementary O is split out, the Zn<sup>++</sup> ions re-  
maining in their normal lattice positions; their charges are  
compensated by the electrons which are left from the O ions.  
B. Eukla

HORAK, J.

Thermal dissociation of zinc chalcogenides. Horák and Jití Klíkorka (Vysoká škola chem.-technol., Pardubice, Czech.). *Sborník věd. prací, Vysoká škola chem.-technol. Pardubice* 1959, 59-66. — The luminescence of 10 samples of ZnO irradiated by cathode rays was studied at atm. pressure and *in vacuo*. The samples were previously heat-treated at 400–1400° for 30 min. Samples treated at 800–1400° exhibited a green luminescence (max. intensity at 1250°) owing to a disson. of ZnO and escape of O. A similar explanation was suggested for behavior of other semiconductors (ZnS, ZnSe, and ZnTe). Alexej B. Bulkovas.

CZECHOSLOVAKIA/Electronics - Semiconductors.

H-

Abs Jour : Ref Zhur Fizika, No 3, 1960, 6434

Author : Koseh, F., Horak, J., Kaspar, J.

Inst : Technical or Chemical College, Pardubice, Czechoslovakia

Title : Conductivity of Copper Tungstate

Orig Pub : Collect. Czechsl. Chem. Commun., 1959, 24, No 6, 2034-2037

Abstract : Sintered specimens of  $\text{CuWO}_4$  were used to investigate the dependence of the conductivity on the temperature. From this dependence, the energy of activation was calculated; on the basis of the analysis of the lines and the Debye patterns of certain conducting specimens of  $\text{CuWO}_4$ , the strength of the Cu -- O -- W bond is evaluated.

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27  
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The luminescence of cadmium tungstate. J. Klikorka,  
L. Horák, and A. Čelíkovský (Vysoká škola chemicko-  
technol., Pardubice, Czech.). *Collection Czechoslov. Chem.*  
Commun. 25, 388-93(1960).—Radiation intensity vs. wave  
length was detd. for CdWO<sub>4</sub> samples heated in air, O, H, N,  
and in *vacuo*. From the luminescence intensities and posi-  
tions of resulting max. the processes are discussed which lead  
to the formation of luminescent samples. The effect of the  
presence of Cu<sup>++</sup> and Mn<sup>++</sup> ions on the luminescence in-  
tensity was investigated. B. Balda

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Distr: 4E2c

The conductivity of silver tungstate. J. Kiliarska, A. Celikovsky, and J. Horak (Vysoka skola chemicka-technol., Pardubice, Czech.). Collection Czechoslov. Chem. Commun. 25, 687-9(1960).—The temp. dependence of the cond. of  $\text{Ag}_2\text{WO}_4$  has an exponential character typical of semiconductors. The cond. does not depend on the partial pressure of the  $\text{O}_2$ . E. E. E.

23070

Z/037/61/000/002/002/003

E133/E435

24,7700(1055,1137,1144)

AUTHORS: Kosek, F., Horák, J. and Kašpar, J.

TITLE: The Semiconducting Properties of Copper Tungstate

PERIODICAL: Československý časopis pro fysiku, 1961, No.2,  
pp.133-140

TEXT: The semiconducting properties of tungstates have been inadequately studied. So far, the reactions during the formation of copper tungstate from metallic oxides have been studied and the diffusion processes at the contact between copper oxide and tungsten oxide (Ref.4: Tamman, G., Westerhold, F., Z.anorg.allg. Chem.35 (1925),149). Recently, the equilibrium between copper tungstate and hydrogen as well as the thermodynamic properties of copper tungstate have been studied (Ref.5). The electrical properties of sintered samples of copper tungstate were studied by the authors. The samples were prepared from sodium tungstate (Merck) and copper nitrate. From these, tungsten oxide and copper oxide were prepared. These were mixed and heat-treated at 800°C for 48 hours in oxygen. Samples 1 and 2 were prepared by this method while another two samples (3 and 4) were prepared by mixing the oxides into molten sodium chloride. The melt was held at  
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Z/037/61/000/002/002/003

E133/E435

The Semiconducting Properties ...

820°C for 48 hours. After cooling, the powdered preparation was extracted in hot distilled water and washed in water several times. The samples were pressed at 15000 kg/cm<sup>2</sup> into cylindrical shape and heated in a quartz tube to 580°C for 4 hours in oxygen. After slow cooling, gold contacts were evaporated onto the samples. These electrodes proved ohmic between 0 and 1 Volt. The measurements on all samples gave identical and reproducible results. The conductivity  $\sigma$  of the samples was measured at a constant oxygen pressure of 750 mm Hg in the temperature range from 273 to 873°K. Fig.1 shows the results for the samples 1 to 4. The samples sintered at lower partial pressures (about 50 mm Hg) of oxygen showed higher conductivity than those sintered at atmospheric pressure of oxygen. An investigation of the dependence of the conductivity upon the partial pressure of oxygen was undertaken next. The measurements were taken only after equilibrium had been set up, i.e. after approximately 15 hours.  $\sigma$  was found to be a linear function of the partial pressure of oxygen. It can be expressed by the equation

$$\sigma = \text{const} \times p_{O_2}^{-\frac{1}{x}}$$

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E133/E435

The Semiconducting Properties ...

where  $P_{O_2}$  is the partial pressure of oxygen. The values of  $x$  vary between 3.48 at 703°K and 4.96 at 856°K. We might speculate that the conductivity is due to either oxygen vacancies or to copper (or tungsten) ions or atoms in interstitial positions. In the monoclinic lattice, the second possibility seems rather unlikely. Assuming that the conductivity is due to the electrons from oxygen anions, we can calculate the conductivity as a function of partial pressure of oxygen and find that the probable mechanism is given by equation 1:

- (1) oxygen molecule  $\rightleftharpoons$  oxygen atom + (oxygen vacancy)<sup>+</sup> + e<sup>-</sup>
- (2) oxygen molecule  $\rightleftharpoons$  oxygen atom + (oxygen vacancy)<sup>++</sup> + 2e<sup>-</sup>

At higher temperatures, a second mechanism (equation 2) might come into action. This assumption is supported by the fact that the dependence of  $\log \sigma$  upon  $1/T$  changes at about 693 to 753°K (Fig.1). Measurements of the thermoelectric e.m.f. as a function of temperature supported the assumption that copper tungstate is an n-type semiconductor. The view that oxygen vacancies determine the conductivity of copper tungstate is in agreement with



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X

The Semiconducting Properties ... Z/037/61/000/002/002/003  
E133/E435

Landsberg et al (Ref.11) and Pschera and Hauffe (Ref.12).  
The luminescent properties of cadmium tungstate also point to  
oxygen vacancies as the most likely defects in this substance,  
which is isomorphous with  $\text{CuWO}_4$ . There are 5 figures and  
13 references: 4 Soviet-bloc and 9 non-Soviet bloc).

ASSOCIATION: Vysoká škola chemickotechnologická, Pardubice  
(School of Chemical Technology, Pardubice)

SUBMITTED: April 28, 1960

Card 4/5

23071

Z/037/61/000/002/003/003  
E133/E435

26.2421 9.4300 (1164, 1385)  
AUTHORS: Čermák, K. and Horák, J.

TITLE:

PERIODICAL: Československý časopis pro fysiku, 1961, No.2,  
pp.141-148

TEXT: The photovoltaic effect of cadmium telluride has recently aroused interest because of the possibility of its use in solar batteries. Various authors reported measurements of the photovoltaic effect between cadmium telluride and various thin surface layers. The present authors studied the photovoltaic effect of thin films of p-type cadmium telluride evaporated onto a metallic substrate. The cadmium telluride was evaporated onto a layer of either tellurium or aluminium and the second contact was formed by 0.001% of Cu, Pb and Si. The area of the layers was about 0.5 or 1 cm<sup>2</sup> and the thickness 0.6 μ and 0.2 μ. The resistivity of the layer was approximately 10<sup>8</sup> ohm cm. Three samples were used for the measurements: a) Te-CdTe-Cd (smaller resistance); b) Te-CdTe-Cd (larger resistance); c) Al-CdTe-Cd.

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Z/037/61/000/002/003/003  
E133/E435

## Photovoltaic Effect ...

All the cells showed non-linear d.c. characteristics both in the dark and under illumination. The maximum resistance occurs when the cadmium contact is positive. This is in agreement with the assumption of a p-type layer of CdTe which is also in agreement with the thermoelectric and photoelectric e.m.f.'s. The samples were highly unstable. From a.c. measurements of the resistance and capacity, it seems established that a barrier layer of the Schottky type exists in the cells. The internal resistance found from measurements of the photoelectric e.m.f. was  $4.65 \times 10^4$  ohm for sample (a). The photoelectric current has been found linearly proportional to the absorbed radiative energy within the full spectral range. The photovoltaic e.m.f. increases linearly with absorbed energy up to about 10 mV but shows a tendency to saturate at higher energies. Samples studied by the present authors did not show a maximum in their photosensitivity within the range of the wavelengths investigated, while commercial CdTe cells do show a maximum within this range. There are 7 figures and 11 references: 3 Soviet-bloc and 8 non-Soviet-bloc.

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1

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Photovoltaic Effect ...

Z/037/61/000/002/003/003  
E133/E435

ASSOCIATION: Katedra fyziky, katedra anorganické chemie,  
Vysoká škola chemicko-technologická, Pardubice  
(Chair of Physics, Chair of Inorganic Chemistry,  
School of Chemical Technology, Pardubice)

SUBMITTED: July 29, 1960

Card 3/3

HORAK, J.; KOSEK, F.

Photovoltaic effect of zinc telluride.. Coll Cz Chem 28 no.1:173-180 Ja '63.

1. Institut für allgemeine und anorganische Chemie und Physikalisches Institut, Technische Hochschule für Chemie, Pardubice.

HORAK, Jaroslav, .inz., CSc.

Contribution to the problem of the future yield of Czechoslovak forests. Les cas 9 no. 12: 1105-1124 D '63.

1. Vedecka laborator biogeocenologie a typologie lesa,  
Vysoka skola zemedelska, Brno.

HORAK, Jaroslav

Cupulometric findings in patients with chronic otitis media and positive fistula syndrome. Cesk. otolar. 9 no.4:218-222 Ag '60.

1. Otolaryngologicka klin. Karlovy university v Praze, predn. akademik  
Antonin Precechtel.  
(OTITIS MEDIA diag.)  
(VESTIBULAR APPARATUS physiol.)  
(EAR dis.)

HORAK, Jaroslav

Cupulometric findings in patients treated with streptomycin. Cesk.  
otolar 10 no.5:270-275 0 '61.

1. ORL klinika fak. vseob. lek. University Karlovy, predn. prof. MUDr.  
K. Sedlacek.

(STREPTOMYCIN toxicol) (COCHLEA pharmacol)  
(ACOUSTIC NERVE pharmacol)



VEJVÁLEK, J.; HOBÁK, J.

Injuries of the triangular bone of the wrist. Acta chir. orthop.  
traum. cech. 31 no.5:422-426 O 1964.

1. II chirurgická klinika fakulty všeobecného lékařství Karlovy  
University v Praze (prednosta prof. dr. J. Dvořák).

HORAK, Jaroslav

Vestibular recruitment. Cesk. otolaryn. 11 no.4:240-243 Ag '62.

1. Klinika nemoci usnich, nosnich a krcnich fak. vseob. lek. Karlovy  
university v Praze, prednosta prof. dr. K. Sedlacek.  
(VESTIBULAR FUNCTION TESTS)

HORAK, J.

Subjective cupulometry in vertige. Cesk. otolar. 11 no.5:287-290 '62 .

1. Otolaryngologicka klinika fakulty vseobecneho lekarstvi University  
Karlovy v Praze, prednosta prof. dr. K. Sedlacek.  
(VERTIGO)

CEPICKA, Jan; TOMANEK, Rostislav; HORAK, Jaroslav.

Contribution of psychiatry and otorhinolaryngology to the  
problem of congenital syphilis. Acta Univ. Carol. [Med.]  
(Praha) 10 no.2:165-170 '64

1. Psychiatricka klinika fakulty vseobecneho lekarstvi Uni-  
versity Karlovy v Praze (prednosta: prof. MUDr. Vl. Vondracek,  
DrSc.); Klinika usniho, nosniho lekarstvi fakulty vseobecneho  
lekarstvi University Karlovy v Praze, (prednosta: prof. MUDr.  
K.Sedlacek).

HORAK Jaroslav, inz.

Meeting of the Commission of Glass and Ceramic Industry of the  
International Trade Union of Chemical Industry. Sklar a keramik  
15 no.2:35-36 F '65.

1. Chariman of the Commission of Glass and Ceramic Industry of  
the International Trade Union of Chemical Industry.

21(3)

CZECH/3-59-9-20/39

AUTHOR: Horák, J. and Koldovský, M.

TITLE: Artificial Radioactivity of the Atmosphere (Umělá radioaktivita ovzduší)

PERIODICAL: Křídla Vlasti, 1959, Nr 9, pp 16 and 17 (CSR)

ABSTRACT: Authors explain, for the benefit of Civil Defense workers, the origin of artificial radioactivity and the method to measure the amount of radioactivity. There are 2 photos and 3 diagrams.

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Horak, Jiri

PHASE I BOOK EXPLOITATION CZECH/5120

Meteorologie pro sportovní letce (Meteorology for Sports Flyers) Prague, Naše vojsko, 1960. 241 p. 4,000 copies printed. (Series: Kniznice svazarmy, sv. 5)

Ed.: Karel Zelený; Assistant Editors: For Ch. 2: Mojmir Prokop, Doctor; Ch. 3: Theoretical pt. Mojmir Prokop, Doctor, and Ivan Cernoch, Chs.: 4, 6, and 7: Oldrich Kostka, Doctor; Chs.: 5 and 13: Ludislav Hala, Doctor; Chs.: 8 and 9: Jaroslav Kopáček, Doctor; Chs.: 10: Milan Kolovsky and Jiri Horak; Chs.: 11-14: Jiri Vorchtgot, Doctor; Resp. Ed.: Jiri Mak.

PURPOSE: This book is intended for sports plane and glider pilots.

COVERAGE: The book, composed to meet the needs of the aeroclubs of Svaz pro spolupraci s armadou (Union for Cooperation With the Army), discusses the principal types of weather phenomena likely to be encountered in flight. The measurement of meteorological elements is described. Meteorological phenomena of particular interest to glider pilots, viz., convection, turbulence, mountain currents, etc., are treated in some detail. Synoptic maps and weather reports are briefly described. Review questions accompany each chapter. No personalities are mentioned. There are 42 references: 7 Soviet, 21 English, 6 Czech, 4 German, and 2 Polish.

Card 1/2

39205

S/263/62/000/004/006/009  
1004/1204

22.2131  
AUTHOR: Vokoun, Josef and Horák, Jiří

TITLE: Dosing device for small amounts of liquids

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 32. Izmeritel'naya tekhnika. no. 4, 1962, 31. abstract 32.4.218 P. Czech. patent, class, 59 a, 5; 42 e, 9, no. 95602, June 15, 1960

TEXT: A device for dosage of small amounts of liquids (0 to 0.5 cm<sup>3</sup>) with an accuracy of  $\pm 0.001$  cm<sup>3</sup> is described. At the beginning of the operation cycle, pistons (P) 1 and 2 (cf. figure) remain in their initial positions, to the left and to the right of the opening 7 of the inlet channel 8 at a precisely determined distance from a calibrated edge 9 located in a plane A perpendicular to the axis of the tube 3. This distance is established by means of a measuring screw 4 with a stop 5 pressed to it firmly. When P 1 is displaced in relation to P 2, which is kept in the initial position by the spring 6, the distance between the ends of both P pistons decreases and the excess of liquid passes into the channel 8. When the end of P 1 passes over the edge 9, the removal of the excess liquid stops and the amount of liquid which remained in the tube 3 corresponds to the predetermined dose. Further displacement of P 1 causes a displacement of P 2, which compresses the spring 6; as a result the dose of the liquid flows into the opened channel 10, after which the ends of P 1 and P 2 will touch one another. The device may be used in pharmaceutical, chemical and food industries, for lubrication, injection of fuel into combustion chambers, etc.

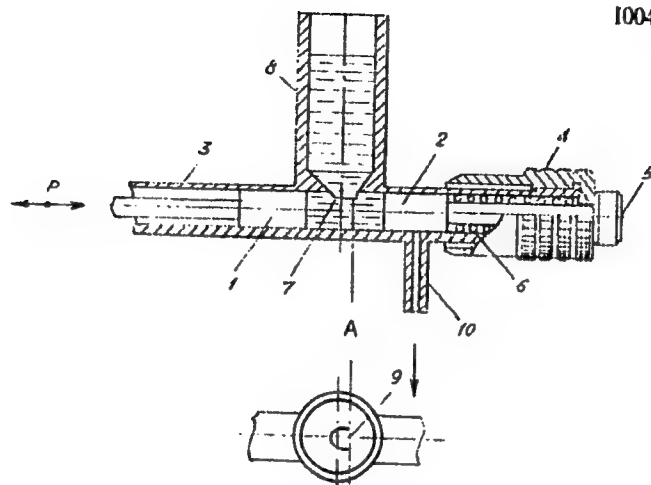
[Abstracter's note: Complete translation.]

Card 1/2



Dosing device for...

S/263/62/000/004/006,009  
1004/1204



Figure

Card 2/2

HORAK, Jiri, akademik

Meeting of the Permanent Council of the International Union of  
Anthropological and Ethnological Sciences in Prague. Vestnik CSAV  
71 no.5:548-551 '62.

10. HORÁK J. and MALÝ V. 1. por.-gyn. Kl. a Úst. org. zdrav. KU, Praha.  
Vztah menarche ke vzniku karcinomu rodidel. The relation between  
menarche and genital carcinoma ČSL. GYNAEK. 1955, 2 (106-  
108) Graphs 1 Tables 2

This is an exact mathematical analysis of the age of menarche of 2,000 women  
treated for carcinoma of the corpus or cervix uteri or for ovarian carcinoma, and  
of 1,000 control cases from the obstetrical service. The menarchal age in the  
cancer group is significantly higher than in the control series. No explanation is  
offered for this fact, but its importance for the detection of early genital carcinoma  
is emphasized.  
Rohan - Valašské Meziříčí (X, 5, 16)

EXCERPTA MEDICA Sec 10 Vol.9/11 Obstetrics Nov 55

1975. HORÁK J., STAŠŤNÝ J. and MÁLEK J. 1. Porodnické a Gynekol. Klin.,  
Karlovy Univ., Praha. \*Poměry leukocytů a lymfocytů v průběhu spontánního  
porodu. The relation of leucocytes and lymphocytes during spontaneous delivery  
CAS.LEK.ČES. 1950, 95/13 (350-362)

Graphs 8

It was found that the number of leucocytes increases two days prior to delivery. At the beginning of delivery the number of white cells reaches a value of 15,000 to 25,000 and drops to normal during labour. The number of lymphocytes decreases to as little as 5% during labour. The relation of leucocytes and lymphocytes is illustrated by several graphs. The authors think it of practical value that the increase of leucocytes and the relative decrease of lymphocytes make it possible to ascertain the biological commencement of the delivery sooner that it can be established clinically.

Kříž - Brno

CZECHOSLOVAKIA/Human and Animal Physiology (Normal and Pathological): Blood. Formed Elements.

T-3

Abs Jour : Ref Zhur - Biol., No 16, 1958, 74650

Author : Stastny, Jiri; Malek, Jiri; Horak, Jiri

\* Inst : -

Title : Quantitative Changes of Leukocytes and Lymphocytes in Pathological Breeds.

Orig Pub : Casop. lekaru ceskych, 1956, 95, No 13, 362-365.

Abstract : No abstract.

\* Z. I. PORODNICE A GYNKOLOGIE KLINIKY KARLOVY UNIVERZITY V  
PRAZE, PREDNISA PROF. DR. KAREL KLAS.

Card 1/1

CZECHOSLOVAKIA/Human and Animal Physiology: Blood

APPROVED FOR RELEASE: 09/21/2001

CIA-RDP86-00513R000618120012-0"

Abs Jour : Ref Zhur - Biol., No 2, 1958, 8486

Author : Jiri Malek, Jiri Horak and Jiri Stastny

Inst : -

Title : The Relationship of Biological Processes Connected with Birth to the White Blood Cell Fraction.

Orig Pub : Casop. lekaru ceskych, 1956, 95, No 16, 434-438

Abstract : The daily cycle of fluctuations in the number of leukocytes, eosinophils and lymphocytes was studied in 205 parturient women and their newborn infants, whose births were both normal and pathological. The lymphocytic reaction was more marked than the general leukocytic one.

Card 1/1

STASTNY, Jiri, MUDr.; HORAK, Jiri, MUDr.

Effect of hydrogenated ergot alkaloids on mammary gland in the first days of puerperium. Cesk. gyn. 22[37] no.1/2:131-136 Jan 58.

1. por.-gyn. klinika KU v Praze, prednosta prof. Dr K. Klaus.  
J. S., Praha 2, Apolinaraska 18.

(ERGOT ALKALOIDS, eff.

lactation in early puerperium (Cz))

(PUERPERIUM,

eff. of hydrogenated ergot alkaloids on lactation  
in early puerperium (Cz))

(LACTATION, eff. of drugs on

hydrogenated ergot alkaloids in early puerperium (Cz))

TRNKA, V.; FANTOVIA, B.; HORAK, J.; STASTNY, J.

Follow-up of the permanent effects of antibiotic therapy of gynecological inflammations by means of a clinical investigation method. *Cesk. gyn.* 23[37] no.7:555-558 Oct 58.

1. I. gyn. klinika KU v Praze, prednosta prof. dr Karel Klaus.  
    (GYNECOLOGICAL DISEASES, ther.  
      antibiotics in inflamm., follow-up (Cz))  
    (ANTIBIOTICS, ther. use.  
      gynecol. inflamm., follow-up (Cz))

HORAK, Jiri

Sexual-gynecological problems in women after abdominal hysterectomy  
and supravaginal amputation of the uterus. Cesk. gyn. 26 [40]  
no.5:378-382 1961.

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Mechanism of sorption of cesium on manganese(IV)-hydroxide.  
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Distr: 4E2c(J)/4E3d

Reaction of phosphine and of phosphorous acid with aldehydes. I. Reaction of phosphine with benzaldehyde. V. Etzel and J. Horak, *Vysoka škola chem. technol. Prague*, Collection Czechoslov. Chem. Commun. 25, 1101-8 (1960). In the presence of HCl,  $\text{PH}_3$  added to the CO group of benzaldehyde to form bis( $\alpha$ -hydroxybenzyl)phosphine,  $\text{C}_{12}\text{H}_{14}\text{O}_2\text{P}$ , m. 107-11° (EtOH).  $\text{PH}_3$  from 45 g P passed in 2 hrs at 15-40° the next fraction, kept 12 hrs at 20° distd at 12 mm, the product chilled and recrystd from 50 ml EtOH gave 35 g I, m. 108-9° (EtOH). During the passage of  $\text{PH}_3$ , 10-40% cryst side-product,  $\text{C}_{12}\text{H}_{14}\text{O}_2\text{P}$ , m. 110° (EtOH), which was apparently a cyclic acetal of BzH and bis( $\alpha$ -hydroxybenzyl)phosphine,  $\nu$  2305 (P-H bond), and 1100  $\text{cm}^{-1}$  (COC), no OH bonds. In a medium of alc HCl, the alc took part in the reaction to give 80-90% tris( $\alpha$ -methoxybenzyl)phosphine, m. 80-3° (MeOH), 85% bis( $\alpha$ -ethoxybenzyl)phosphine, m. 107-11° (EtOH), and 65% bis( $\alpha$ -isopropoxybenzyl)phosphine, m. 70-4° (MeOH under N<sub>2</sub>). BzH with  $\text{PH}_3$  in EtOH and BuOH failed to give cryst. compds. and yielded instead, oily products, presumably bis( $\alpha$ -propoxybenzyl)phosphine and bis( $\alpha$ -butoxybenzyl)phosphine. L. J. Urbánek

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ETTEL, V.; HORAK, J.

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1. Institut für organische Technologie, Technische Hochschule  
für Chemie, Prag.

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1. Institut für organische Technologie, Technische Hochschule  
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(Phosphine) (Hypophosphorous acids) (Formaldehyde)  
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Part 5: Research on interreaction of hypophosphorous acids with  
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(Phosphine)	(Hypophosphorous acids)	(Formaldehyde)
	(Benzaldehyde)	

CZECHOSLOVAKIA

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zavod, Praha.



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SOURCE: East European Accessions List (EEAL) Library of Congress,  
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Reduction of working hours in the Moravia Glassworks in Kyjov. p.162.  
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SO: Monthly List of East European Accessions (EEAL) LC. Vol. 6, No. 9, Sept. 1957. Uncl.

CZECHOSLOVAKIA/Chemical Technology. Chemical Products and Their H-13  
Application. Ceramics. Glass. Binding Materials. Concrete

Abs Jour : Ref Zhur - Khim., No 24, 1958, No 82425

Author : Horak J.

Inst :

Title : Operational Problems of Glass Decolorization

Orig Pub : Skalná keramik, 1958, 8, No 3, 76-78

Abstract : Experiments conducted at the Moraviya glass plant (Kiyev, CDR) on the decolorization of cut glass (CG) are described. CG is being produced in crucibles of approximately 120 kg capacity from a mix containing (in kg): 75 - sand, 12 dolomite, 25-98%  $\text{Na}_2\text{CO}_3$ , 5-30-85%  $\text{K}_2\text{CO}_3$ , and 0.5 - sulfate. 110 gr of  $\text{KNO}_3$  plus 40 gr of  $\text{As}_2\text{O}_3$  plus 30 gr of decolorizing agent (D) consisting of 2.6 kg of borax plus 92 gr of boron selenide plus 6 gr  $\text{CaO}$  are also added. From the above batch, 98.5 kg of CG are obtained. The average life of a crucible is approx. 6 melts. It has been noted from actual experience

Card : 1/2

CZECHOSLOVAKIA / Chemical Technology. Chemical Products H  
and Their Application. Ceramics. Glass. Binding  
Materials. Concrete.

Abs Jour: Ref Zhur-Khimiya, No 12, 1959, 43145.

Author : Horak J.

Inst : Not given.

Title : Homogeneity of Colorless Glass and its Effect on  
the Quality of Glass Containers.

Orig Pub: Sklar a keramik, 1958, 8, No 9, 262-264; No 10,  
311-312.

Abstract: The deciding effects on the quality of glass con-  
tainers has chemical composition of glass, shape  
of a container, wall thickness, internal stresses,  
and homogeneity of glass. Colorless glass used in  
the manufacture of glass containers contains (in  
%): 70-74  $\text{SiO}_2$  up to 3 of  $\text{Al}_2\text{O}_3$  and  $\text{Fe}_2\text{O}_3$ , 9-12 of

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H-22

CZECHOSLOVAKIA / Chemical Technology. Chemical Products  
and Their Application. Ceramics. Glass. Bind-  
ing Materials. Concrete.

Abs Jour: Ref Zhur-Khimiya, No 12, 1959, 43145.

Abstract:  $\text{CaO}$  and  $\text{MgO}$ , and 14-16 of alkaline oxides. For  
the evaluation of glass homogeneity (GH), it is  
being done with the aid of polarized light. For  
the determination of products' uniformity, ring  
samples immersed in benzene or chlorobenzene are  
used. The described method permits an orientation  
determination of GH with five gradations of the GH  
degree proposed. However, the presented classifi-  
cation suffers in accuracy and in the subjective-  
ness. The product uniformity may also be deter-  
mined through chemical analyses of samples obtained  
from various portions, and also through the control  
of glass density determined by the Noyt and Daff's  
method. In the latter instance, densities of the

Card 2/4

HORAK, Josef, inz.; KRASL, Antonin

Effect of internal stress on the heat resistance of white  
packing glass. Sklar a keramik 12 no.3:72-73 Mr '62.

1. Sklarny Moravia, narodni podnik, Kyjov (for Horak).
2. Obalove a lisovane sklo, narodni podnik, Dubi u  
Teplic (for Krasl).

Z/039/60/021/02/003/037  
E192/E535

AUTHOR: Horák, Július

TITLE: Directional Couplers  
to Each Other

PERIODICAL: Slaboproudý obzor, 1960, Vol 21, No 2, pp 72-78  
Made of Waveguides Perpendicular

ABSTRACT: Directional couplers are very often used in waveguide techniques. By means of the couplers it is possible to take some of the power from the main waveguide into a branching waveguide. The main parameters of the directional couplers are: the coupling loss and the directivity. The coupling is defined by

$$V = 10 \log \frac{P_1}{P_4} \quad (1)$$

where  $P_1$  is the power at the input (see Fig 1) and  $P_4$  is the power at the output 4, it being assumed that the direction of the propagation in the main waveguide is from 1 to 2 (see Fig 1). The directivity is defined by

$$S = 10 \log \frac{P_4}{P'_4} \quad (2)$$

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E192/E535

# Directional Couplers Made of Waveguides Perpendicular to Each Other

where  $P'_4$  is the power at the output 4 when the propagation direction in the main waveguide is from 2 to 1. The directivity can be achieved by several methods. In the following it is shown that comparatively simple wideband directional couplers can be obtained by combining 2 waveguides perpendicularly to each other and by providing the coupling hole between them (Fig 1). The functioning of this system is investigated analytically. A rectangular waveguide shown in Fig 2 is considered. It is assumed that when the electromagnetic wave propagates in the z direction, the field is given by Eqs (3); for the propagation direction -z, the field components are expressed by Eqs (4). The excitation of electromagnetic field by a hole can be investigated on the basis of the Bethe theory (Ref 1). According to this theory a small coupling hole between two waveguides can be regarded as dipoles which excite the electromagnetic waves propagating in both directions from the hole. Under the assumption

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E192/E535

# Directional Couplers Made of Waveguides Perpendicular to Each Other

that the wave in the main waveguide propagates in the direction  $p$  (see Fig 3) the propagation constants for the secondary waveguide which is perpendicular to the main one, are given by Eqs (5). In these  $A^+$  is the propagation constant for the wave which propagates in the direction  $z$  while  $A^-$  is the propagation constant for the direction  $-z$ . The quantities to be determined in these equations are the so-called polarization coefficients. These depend on the shape of the coupling hole. The coefficients for circular, rectangular and cross-shaped holes are indicated in Table 1. Thus it is found that the propagation constants for the case of the circular hole are given by Eqs (8), while for the cross-shaped hole they are expressed by Eqs (9). The coupling loss for the circular waveguide can be expressed by Eq (11) and the directivity by Eq (12). The functions  $F_E$  and  $F_H$  in these equations are defined by Eqs (10). Eqs (11) and (12) were used to design a directional coupler for the wave

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Directional Couplers Made of Waveguides Perpendicular to Each Other

length of 6 cm. The results are indicated in Figs 5 and 6. It was found however that coupling losses of about 20 dB could not be obtained by means of a circular hole. For this purpose a cross-shaped hole was employed. The coupling loss and the directivity of this type of coupler are indicated in Figs 9 and 10. In special cases it is possible to employ couplers based on 2 cross-shaped holes. A coupling system at 20 dB with two cross-shaped holes is illustrated in Fig 17. On the basis of the theory and some experimental results it is concluded that it is possible to design a directional coupler in such a manner that the coupling loss over the whole bandwidth of the waveguide will be practically constant and the directivity will be higher than 10 dB. There are 18 figures, 1 table and 11 references, 2 of which are Czech and 9 English.

ASSOCIATION: TESLA Pardubice, n.p. (TESLA State Factory of  
Pardubice)

SUBMITTED: October 1, 1959  
Card 4/4

87982  
9.1310 (and 2604, 2904, 1144) Z/039/61/022/001/005/006  
E192/E382

AUTHOR: Horák, Július

TITLE: Power Transfer Through a Cut-off Attenuator

PERIODICAL: Slaboproudý obzor, 1961, Vol. 22, No. 1,  
pp. 31 - 36

TEXT: The work is devoted to the investigation of the characteristic of a reflection-type waveguide attenuator. In the analysis it is assumed that the walls of the waveguides are ideally conducting and the medium inside the waveguides is lossless. The propagation constant for the waveguide is given by:

$$\gamma = \frac{2\pi}{\lambda_k} \sqrt{1 - \left(\frac{\lambda_k}{\lambda}\right)^2} \quad (5)$$

where  $\lambda_k$  is the critical wavelength for the guide and  
 $\lambda$  is the wavelength of the source.

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E192/E382

# Power Transfer Through a Cut-off Attenuator

When  $\lambda_k > \lambda$ , the waveguide is overcritical and  $\gamma$  is an imaginary quantity so that the wave propagates without attenuation. In the undercritical case when  $\lambda_k < \lambda$ ,  $\gamma$  is a real quantity and the amplitude of the wave is heavily attenuated. The power transmitted in an undercritical waveguide can be expressed by:

$$P_p = -X_o |I_p^+|^2 |\Gamma_{pk}| e^{-2\gamma(l-z)} \sin \varphi \quad (17)$$

where  $X_o$  is the characteristic impedance of the guide,  
 $I_p^+$  is the current amplitude,  
 $\Gamma_{pk}$  is the reflection coefficient and  
 $\varphi$  is the phase of the reflection coefficient.

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# Power Transfer Through a Cut-off Attenuator

The above formula is applied to the analysis of the system shown in Fig. 4. Here, the undercritical section having a wave impedance  $jX_o$  is connected between two sections having wave impedance  $R_o$ . The impedance of the load referred to the input of the undercritical section is  $Z_k$  and the impedance of the source referred to the section is  $Z_v$ . The reflection coefficient is now given by:

$$\Gamma_{pk} = |\Gamma_{pk}| e^{j\varphi} = \frac{Z_k - jX_o}{Z_k + jX_o} \quad (18)$$

and the power transmitted is expressed by:

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E192/E382

Power Transfer Through a Cut-off Attenuator

$$P_p = \frac{2R_o |I_n^+|^2 |\Gamma_{pk}| e^{-2\gamma \ell} \sin \Theta \sin \varphi}{\left| 1 - |\Gamma_{pk}| e^{j(\varphi + \Theta) - 2\gamma \ell} - \Gamma_{nv} (|\Gamma_{pk}| e^{j\varphi - 2\gamma \ell} - e^{j\Theta}) \right|^2} \quad (32)$$

where  $\Theta$  is defined by:

$$e^{j\Theta} = \frac{R_o - jX_o}{R_o + jX_o} \quad (23) .$$

In practice, the impedances of the source and the load are matched so that  $Z_v = Z_k = R_o$  and Eq. (32) can be simplified since  $\varphi = \Theta$ . The maximum power transfer to the system occurs when  $\ell = 0$ , i.e. when the load is connected directly to the source. The ratio of the maximum power to the power

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Power Transfer Through a Cut-off Attenuator

transmitted through the attenuator (for the matched case)  
is now given by:

$$\frac{P_{\max}}{P_p} = \frac{1 + e^{-4\gamma l} - 2 e^{-2\gamma l} \cos 2\varphi}{4 e^{-2\gamma l} \sin^2 \varphi} \quad (37) .$$

If this formula is expressed in db, the attenuation is  
given by:

$$L = 8.686 \gamma l + 10 \log \frac{1 + e^{-4\gamma l} - 2 e^{-2\gamma l} \cos 2\varphi}{4 \sin^2 \varphi} \quad (40) .$$

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# Power Transfer Through a Cut-off Attenuator

The first term in this formula and the denominator of the second term represent a linear attenuation (which is directly proportional to the length of the attenuator) while the second term represents a nonlinear increment. A graph of the attenuation  $L(\gamma)$  is given and the magnitude of the nonlinearity is plotted for various values of  $X_0/R_0$ . The graph of the optimum values of  $X_0/R_0$  for a given nonlinearity  $\Delta$  is evaluated. It is found that the lowest nonlinearity is achieved when  $X_0/R_0 \approx 2.414$ . The problem was also investigated experimentally at wavelengths ranging from 25 - 72 mm and it was found that the theory was in good agreement with experiment. There are 8 figures and 5 non-Czech references.

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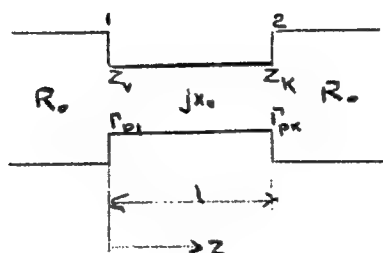


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E192/E382

Power Transfer Through a Cut-off Attenuator

Fig. 4:



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E192/E382

Power Transfer Through a Cut-off Attenuator

ASSOCIATION: Tesla Pardubice n.p. - Výzkum a  
vývoj radiotechniky  
(Tesla Pardubice State Enterprise -  
Department of Radioengineering Research)

SUBMITTED: July 27, 1959

44

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35160

2/039/62/025/001/005/007  
2291/5305

9.6000 (1040,1159)

AUTHORS: Horák, Julius, Vebr, Miloš, and Štol, A, Milivoj

TITLE: Cavity wavemeters with direct frequency reading

PERIODICAL: Slaboproudý obzor, v. 23, no. 1, 1962, 29 - 33

TEXT: The article describes the development of a prototype resonant-cavity wavemeter for direct frequency reading in the 3 cm band, type MLL, developed by the TESLA Pardubice, National Enterprise, Research and Development Plant in Opočinec. The MLL wavemeter is an improved version of the QMV 222 11-12 wavemeter for the 3 cm band and resembles the design of the wavemeter produced by the Hewlett-Packard Company, described in Ref. 2 (Proc. IRE, October 1958, p. 214), with the exception that it is considerably simpler in design, whereby the tolerance is reduced to a minimum by direct coupling of the cavity piston to a scale on the drum. This drum turns together with the piston in the cavity. To keep the instrument's dimensions to a minimum, the cavity is placed inside the drum and the rectangular waveguide is

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Cavity wavemeters with ...

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coupled to the bottom of the cavity by an elliptical aperture. After a more detailed description of the design and the requirements imposed on the accuracy of the instrument, results of test measurements are listed. It was found that the electrical specifications of the HLL wavemeter are in basic agreement with those of the QW 222 11-11 cavity wavemeter. The calibration curve of the HLL wavemeter also represents the scale of the drum, necessitating an extreme precision, especially as regards cavity dimensions, however, the resultant increase in production costs is offset by the simple operation and rapid frequency reading as confirmed in laboratory tests. There are 10 figures, 1 table and 4 references: 1 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: Electronic Engineering, Sept. 1957, p. 155; Proc IRE, October 1958, p. 21A; Montgomery: Technique of microwave measurements. MIT, Radiation Laboratory Series, New York 1946.

ASSOCIATION: TESLA Pardubice, n.p., výzkumný a vývojový závod Opto-  
ínek (TESLA Pardubice, National Enterprise, Research

Card 2/3

Cavity wavemeters with ...

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and Development Plant in Gpodinek;

SUBMITTED:

July 4, 1961

IX

Card 3/3

HORAK, J.; ZBIROVSKY, M.

Reactions of trichloromethanesulfonyl chloride and its derivatives.  
Pt. 3. Coll Cz Chem 29 no.9:2194-2205 S '64.

1. Technische Hochschule fur Chemie, Prague.

HORAK, J.V.

SURNAME, Given Names

Country: Czechoslovakia

Academic Degrees: /not given/

Affiliation: /not given/

Source: Bratislava, Geograficky Casopis, Vol XIII, No 3, 1961, pp 233-234.

Data: "Terminology for Maps, Particularly Historical Maps. A Discussion  
Held in the Historical Institute of the Czechoslovak Academy of  
Sciences, 15, November 1960."

Authors: HORAK, J.V.  
VANIS, J.

HORAK, K.

The manufacture of gypsum and gypsum prefabricated parts from Opave. p. 411

STAVIVO (Ministerstvo stavebnictvi) Vol. 34, No. 11, Nov. 1956

Praha, Czechoslovakia

SOURCE: East European List (EEAL) Library of  
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Pillar and chamber mining with scrapers in the J. Stetka Mine at Chrastenice.  
p. 73. (Rudy, Vol. 5, No. 3, Mar 1957, Praha, Czechoslovakia)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 2, Aug 1957, Uncl.

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periodicals: RUDY Vol. 6, no. 9, Sept. 1958

HORAK, K. Main problems of prospecting, mining, and ore dressing in Barrandium. p. 298.

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Reverse and zero reactance of electric circuits.  
p. 474. SOVETSKA VEDA: ENERGETIKA. (Československa  
akademie ved. Technická sekce) Praha. Vol. 4,  
no. 4, 1956.

SOURCE: East European Accessions List, (EEAL),  
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December 1956

HORAK, K.

HORAK, K. 400 kv. electric lines in the USSR. p. 614, Vol 4, no. 5,  
1956 SOVETSKA VEDA: ENERGETIKA  
Praha, Czechoslovakia

SOURCE: East European Accessions List (EEAL) Vol. 6, No. 4--April 1957

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Study of electrical engineering in our technical universities.  
(Supplement) p. Tl. ELEKTROTECHNICKY OBZOR. (Ministerstvo  
strojirenstvi a Ministerstvo paliv a energetiky) Praha.  
Vol. 45, No. 1, Jan. 1956

SOURCES: EEAL - LC Vol. 5, No. 10 Oct. 1956

HORAK, K.

O. Weisser and F. Schulz's Elektroenergetika (Electric Power); a book review.

P. 607. (ELEKTROTECHNICKY OEBOR) (Praha, Czechoslovakia) Vol. 46, no. 11, Nov. 1957

SO: Monthly Index of East European Accession (EEAI) IC Vol. 7, No. 5, May 1958

HORAK, K.

Notes on articles written by J. Sedlak concerning the resistance of long electric-power lines; also remarks by J. Sedlak. p. 489.

ELEKTROTECHNICKY OBZOR. (Ministerstvo tezkého strojírenství a Československé vědecká technická společnost pro elektrotechniku při Československé akademii věd) Praha, Czechoslovakia. Vol. 48, no. 9, Sept. 1959.

Monthly list of East European Accessions (EEAI) LC, vol. 9, no. 1, Jan. 1960.

Uncl.

HORAK, K.

Matrix symbols for designing tied-in electric networks.  
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CZECHOSLOVAKIA

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B/035/62/000/011/046/079  
A001/A101

AUTHOR: Horák, Ladislav

TITLE: Railroad transition curve

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 11, 1962, 12 - 13, abstract 110101 ("Geod. a kartogr. obzor", 1962, v. 8/50, no. 5, 84-88, Czech)

TEXT: The author recommends the following method of calculating a railroad transition curve having the shape of a cubic parabola

$$P \equiv \frac{x^3}{6rl} = \frac{x^3}{6a}.$$

To secure a smooth transition of a railroad way into a circular curve, it is necessary that the center of the latter would be located on the common normal to it and to the transition curve. Curvature of transition curve is the same for all radii of the curves; curves with different radii, e.g.  $r_1$  and  $r_2$  (see Figure 1) are joined with the transition curve at points  $ZO_1$  and  $ZO_2$  located at

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distances  $l_1 = np_1 = \frac{\omega}{r_1}$  and  $l_2 = np_2 = \frac{\omega}{r^2}$  from the beginning ZP of the transition curve. Here  $\omega = r_1 = 11.8 \text{ nV}^2$ , where  $n = 10V$  and  $V$  is velocity. The ordinate of the end ZO of the transition curve is determined from the expression:

$$y = k = \frac{l^2}{6r} = \frac{l^3}{6\omega},$$

and tangent of angle  $\beta$ , formed by the tangent with the abscissa axis, is the first derivative of the transition curve equation:

$$y' = \frac{x^2}{2r_1} = \frac{x^2}{2\omega} = \text{tg } \beta.$$

For the end ZO of the transition curve  $\beta = \lambda$ , and  $\text{tg } \lambda = \frac{l}{2r} = \frac{l^2}{2\omega}$ . The coordinates of center S of the curve located on the normal at the point of joining the transition and circular curves have the values  $x_s = l - r \cdot \sin \lambda$ ,  $y_s = k + r \cdot \cos \lambda$ . Radius  $\rho$  of the transition curve curvature is determined from the expression:

$$\rho = \frac{(1+y'^2)^{3/2}}{y''},$$

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where  $y'' = \frac{x}{r^2}$  is the second derivative of the transition curve equation,

$\rho_x = \frac{1r}{x \cdot \cos^3 \beta}$ , and for point Z0 the radius  $\rho = \frac{r}{\cos^3 \beta}$ . In order to eliminate bending of the curve at point Z0, caused by the difference in curvature radii of the transition and circular curves, values of curvature radii  $\rho$  are presented in the tables proposed by the author. Circular curves with the given radius  $r$  are joined into a single transition curve in spots nearest to the maximum value of radius  $\rho$ , but in no case at the point of transition curve calculated for the tabular value of radius  $r$ . The transition curve length along the axis of railway is equal to

$$l_0 = 1 + \frac{1^3}{40r^2} = 1 + \frac{1^5}{40\omega^2}$$

(Figure 2); polar angle  $\delta$ , the angle in the beginning ZP of the transition curve between the main tangent and direction to the end Z0 of the transition curve, is determined from the expression:

$$\operatorname{tg} \delta = \frac{k}{1} = \frac{1}{6r} = \frac{1^2}{6\omega};$$

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the length of secant  $d$  between individual points of the transition curve is equal to

$$d = \sqrt{(k_2 - k_1)^2 + (l_2 - l_1)^2} ;$$

angle  $\gamma$  between the common tangent  $t'$  to both curves and secant in direction to ZP is equal to difference  $\lambda - \delta$ ; the projection length of the tangent onto the abscissa axis

$$s_t = \frac{k}{\operatorname{tg} \lambda} = \frac{l^2}{6r} \cdot \frac{2r}{l} = \frac{l}{3} ;$$

distance between point T and ZP:  $b = l - s_t = \frac{2}{3} l$ ; distance between point T and ZO:  $z = \frac{s_t}{\cos \lambda} = \frac{k}{\sin \lambda}$ ; the length of the tangent to the whole curve with two-sided transition curves of the same length:  $t_o = x_s + y_s \cdot \operatorname{tg} \frac{\alpha}{2}$ ; the total length of the whole curve with transition curves:  $d_o = 2l_o + r \cdot \operatorname{arc} (\alpha - 2\lambda)$  where  $\alpha$  is external angle of extreme tangents. The tables proposed by the author do not call for any calculations while performing a railroad surveying. To survey the junction of circular and transition curves one has to calculate

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# Railroad transition curve

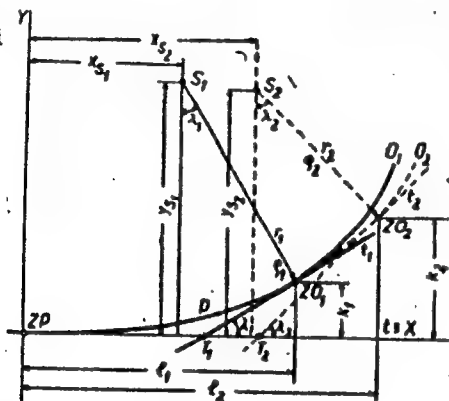
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the position of the center of the circular curve on the common normal, lengths of tangents and the length of the circular curve along the axis of railway. These tables can be used also for a detailed surveying of transition curves.

[Abstracter's note: Complete translation]

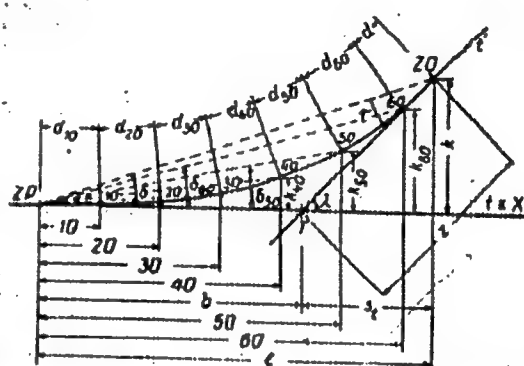
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Figure 1



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Figure 2





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